Agricultural Extension Service ● University of Minnesota

FACT SHEET

4. ANIMAL SCIENCE NO. 23 – 1973

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Trichinosis

Probably no other factor contributes more heavily to consumer doubt about pork than does the fear of trichinosis.

Trichinosis is a disease caused by consuming improperly treated pork (and certain other meats) that contains live trichinae (Trichinella spiralis). Most of the few outbreaks of trichinosis in the U. S. are due to home or locally processed pork products, primarily sausage.

Many consumers often erroneously believe all pork is infected with trichinae. Further, consumers often do not completely understand how trichinae, if present, can be destroyed.

Sources

The most prevalent source of human trichinosis is pork. Some outbreaks of trichinosis have been traced to wild boar meat as well as meat from the bear, the walrus, and other animals. Of the reported cases in the U. S. during the past 5 years, 7.8 percent were attributed to eating infected bear meat (one-half of the nonpork sources of trichinosis in 1972 were due to bear meat).

The clinical symptoms of trichinosis have two distinct phases depending on the stage of development of the parasite. The intestinal phase is caused by immature larvae burrowing through the intestinal mucosa. The symptoms are nausea, vomiting, and diarrhea usually within 24 to 48 hours after eating infected pork. The second phase is seen when the larvae migrate into the muscles and cause fever and weakness. Larvae in the muscle tissue may cause muscular pain and swelling. The central nervous system occasionally becomes involved and then convulsions or coma can result. The average mortality rate for individuals that develop clinical symptoms is about 5 percent.

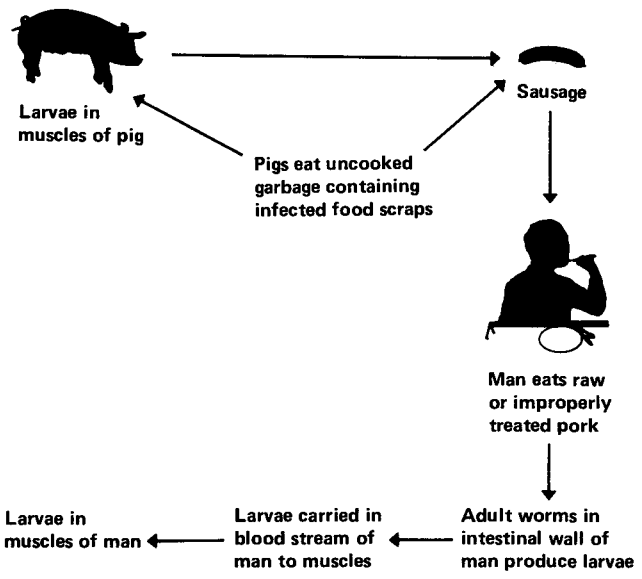

Figure I. Life cycle of trichinae (Trichinella spiralis).

Life Cycle

The life cycle of Trichinella spiralis is shown in figure 1. Pigs get trichinosis most commonly by eating infected meat scraps in raw or improperly cooked garbage. Pigs also enter the chain when they eat carcasses of animals such as rats, mice, dogs, cats, foxes, raccoons, skunks, squirrels, and wolves that are infected with trichinae. The only point at which the life cycle can be broken is the prevention of the consumption of the viable larvae.

Prevalence in Swine

Trichinae were first observed in pork tissue in 1846. Since that time, various surveys have been conducted to determine the prevalence of live trichinae in swine.

The number of swine infected in the last 15 to 30 years has shown a gradual decline. A major reason for this decline has been an increase in the proper cooking of garbage fed to pigs. Pigs fed uncooked garbage always have a greater likelihood of infection (more than ten times greater) than do pigs fed properly cooked garbage.

However, 98.5 percent of all the pigs marketed today are fed grain instead of garbage. This trend is especially important since pigs fed garbage always have a higher rate of infection than do pigs fed grain.

Because of the efforts of pork producers to rid their industry of trichinae, coupled with an intensified surveillance of trichinosis throughout the country, trichinae in today's pork supply is at an all-time low. In fact, the latest survey at a federally inspected pork processing plant revealed only one infected pig out of every 11,500 examined. All pork is not infected with trichinae!

Destroying trichinae

In spite of the low incidence of trichinae in swine, it is fortunate that methods are available to completely destroy any trichinae that might be present in pork.

The most effective way to destroy trichinae in pork is to cook pork to an internal temperature of 137°F throughout. Pork cooked to 137°F still possesses a pink color. Thus, the only accurate and safe way to measure this temperature is by using a meat thermometer. Cook all fresh pork to an internal temperature of 170°F to obtain a desirable cooked pork flavor. "Cook before eating" hams should be cooked to 160°F by the consumer while "fully cooked" hams can be eaten cold or heated to 130°F.

Some sausage products (uncooked summer sausage, etc.) contain pork that has not been heated to destroy any possible trichinae. However, the pork ingredients used in the manufacture of these products have been frozen at certain temperatures continuously for certain lengths of time as follows:

Table 1. Required period of freezing at temperature indicated.

Temperature °F	Days
5	20
-10	10
-20	6

When frozen at these temperatures for these numbers of days and monitored by USDA officials, the resulting product is "certified pork trimmings."

Freezing pork to meet standards for "certified pork trimmings" is very difficult to do in the home freezer. To meet the standards the product must be in separate pieces not more than 6 inches thick, or arranged on separate racks in layers not more than 6 inches deep, or stored in crates or boxes not more than 6 inches deep, or stored as solidly frozen blocks not more than 6 inches thick.

During refrigeration, the product or the containers should be spaced in the freezer to insure free circulation of air between the pieces of meat.

In lieu of the methods prescribed in table 1, the treatment may consist of refrigeration to −30°F in the center of the pieces of meat or commercial freeze drying. However, these latter freezing treatments are impossible to achieve in the home freezer.

Summary

1. The incidence of trichinae in swine is 1 in 11,500.
2. If you prepare uncooked sausage products (or have them prepared for you), insist that the pork products used are "certified pork trimmings." Uncooked ready to eat sausage products bearing the mark of U.S.D.A. inspection have been prepared with "certified pork trimmings" or have undergone a drying procedure to insure trichinae destruction.
3. Do not allow food products that are eaten raw or rare to be crosscontaminated with fresh, raw pork particles either directly or through contact with knives, forks, grinders, etc.
4. Cook all meat loaf containing pork to at least a medium-well degree of doneness.
5. Cook all fresh pork to an internal meat temperature of at least 137°F as measured by an accurate meat thermometer.

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101.